Abstract

This invention provides methods for the stable introduction of heterologous coding sequences into the genome of a bird and expressing the coding sequences to produce desired proteins or to alter the phenotype of the bird. The present invention provides preferred methods for introducing a transgene into the cytoplasm of avian embryonic cells by cytoplasmic microinjection. The embryo then develops into a transgenic adult capable of expressing a heterologous protein and/or capable of generating a line of transgenic birds through breeding. Synthetic vectors and gene promoters useful in the methods are also provided by the present invention, as are transgenic birds that express heterologous protein and avian eggs containing heterologous protein.